

## CLAIMS

1. A computer-implemented method for defining a color gradient to be applied to a region, the method comprising:

5       defining a gradient starting point;  
      defining a gradient ending point;  
      defining at least one intermediary point between the gradient starting point and the  
gradient ending point;  
      defining a set of gradient attributes; and  
10       defining a first and a second set of values for the set of gradient attributes, the first set of  
values defining a transition between the gradient starting point and the at least one  
intermediary point, and the second set of attribute values defining a transition between the at  
least one intermediary point and the gradient ending point, wherein the first and second set of  
values are distinct.

15       2. The method of claim 1, further comprising:

      rendering the color gradient in accordance with the gradient starting point, the gradient  
ending point, the at least one intermediary point, and the first and second set of values for the  
set of gradient attributes.

20       3. The method of claim 2, further comprising:

      applying the rendered gradient to a region including scaling the gradient to fit the region.

25       4. The method of claim 3, wherein the region corresponds to an object.

      5. The method of claim 2, further comprising:

      applying one or more copies of the rendered gradient to a region until the region is  
covered.

30       6. The method of claim 5 wherein the region corresponds to an object.

7. The method of claim 5, wherein each copy has an identical size and shape to the rendered gradient.

8. The method of claim 1, wherein the first and second set of values are different.

9. The method of claim 1, wherein the first and second set of values are defined by a user input.

10. The method of claim 1, further comprising:

defining two intermediary points; and

defining a third set of attributes, the third set of attributes defining a transition between the two intermediary points.

11. The method of claim 10, further comprising:

rendering the color gradient in accordance with the defined gradient starting point, the gradient ending point, the two intermediary points and the first, second and third set of attributes.

12. The method of claim 1, wherein the color gradient is a linear color gradient and the set of gradient attributes includes an angle attribute, and wherein defining a first and a second set of values includes:

defining a value of the angle of the color gradient relative to a tangent of a bounding box edge for the region to which the color gradient is to be applied.

13. The method of claim 1, wherein the color gradient is a radial color gradient and the set of gradient attributes includes an offset attribute, and wherein defining a first and a second set of values includes:

defining a value of the offset of the color gradient relative to a center of a bounding box for the region to which the gradient is to be applied.

14. The method of claim 13, wherein defining a value of the offset includes:

defining a value of an offset in a horizontal direction relative to the center of the bounding box.

15. The method of claim 13, wherein defining a value of the offset includes:

5 defining a value of an offset in a vertical direction relative to the center of the bounding box.

16. The method of claim 1, wherein the set of attributes includes a color attribute, and wherein defining a first and a second set of values includes:

10 defining a color for one or more of the at least one intermediary point, the starting point and the ending point.

17. The method of claim 16, wherein the set of attributes includes a rate of change attribute, and wherein defining a first and a second set of values includes:

15 defining a value of a rate of change of a color in the color gradient between a color associated with one of the starting point, the ending point, and the at least one intermediary point and a color associated with an adjacent point.

18. The method of claim 17, wherein a color is represented by a set of color components and defining a value of a rate of change includes:

20 defining a value of a rate of change for one or more color components in the color gradient between a color component set associated with one of the starting point, the ending point, and the at least one intermediary point and a color component set associated with an adjacent point.

25 19. The method of claim 16, wherein the set of attributes includes a constant color attribute, and wherein defining a first set and a second set of values includes:

defining a value of the constant color attribute defining a portion of the color gradient for which a color component remains constant.

20. The method of claim 16, wherein the set of attributes includes a color traversal attribute, and wherein defining a first and a second set of values includes:

defining a set of colors to be traversed between two defined points in the color gradient.

5 21. The method of claim 20, wherein defining a set of colors comprises:  
defining a set of colors including selecting colors in a color wheel.

22. The method of claim 1, wherein the set of attributes includes a color function attribute, and wherein defining a first and a second set of values includes:

10 defining a mathematical function describing a color variation between two points in the color gradient.

23. The method of claim 22, wherein defining a mathematical function includes:  
defining a non-linear mathematical function.

15 24. The method of claim 22, wherein defining a mathematical function includes:  
defining a mathematical function describing the variation of one or more color components between the two points in the color gradient.

20 25. The method of claim 22, wherein defining a mathematical function includes:  
receiving a user input specifying the mathematical function.

26. The method of claim 1, wherein the set of attributes includes a color contour function attribute, and wherein defining a first and a second set of values includes:

25 defining a mathematical function describing a color contour between two points in the color gradient.

27. The method of claim 26, wherein defining a mathematical function includes:  
defining a non-linear mathematical function.

30 28. The method of claim 26, wherein defining a mathematical function includes:

receiving a user input specifying the mathematical function.

29. The method of claim 1, further comprising:

5 defining a mathematical function describing a variation of a gradient attribute between two points in the color gradient, the gradient attribute being selected from the group consisting of an angle, an offset in a horizontal direction, an offset in a vertical direction, a rate of change for a color, and a portion of the color gradient having constant color.

10 30. A computer program product for defining a color gradient to be applied to a region, the computer program product comprising instructions operable to cause a computer to:

define a gradient starting point;

define a gradient ending point;

define at least one intermediary point between the gradient starting point and the gradient ending point;

15 define a set of gradient attributes;

define a first and a second set of values for the set of gradient attributes, the first set of values defining a transition between the gradient starting point and the at least one intermediary point, and the second set of attribute values defining a transition between the at least one intermediary point and the gradient ending point, wherein the first and second set of values are distinct.

31. The computer program product of claim 30, further comprising instructions operable to cause a computer to:

25 render the color gradient in accordance with the gradient starting point, the gradient ending point, the at least one intermediary point, and the first and second set of values for the set of gradient attributes.

32. The computer program product of claim 31, further comprising instructions operable to cause a computer to:

30 apply the rendered gradient to a region including scaling the gradient to fit the region.

33. The computer program product of claim 32, wherein the region corresponds to an object.

34. The computer program product of claim 31, further comprising instructions operable to cause a computer to:

5        apply one or more copies of the rendered gradient to a region until the region is covered.

35. The computer program product of claim 34 wherein the region corresponds to an object.

10       36. The computer program product of claim 34, wherein each copy has an identical size and shape to the rendered gradient.

37. The computer program product of claim 30, wherein the first and second set of values are different.

15       38. The computer program product of claim 30, wherein the first and second set of values are defined by a user input.

39. The computer program product of claim 30, further comprising instructions operable to cause a computer to:

20        define two intermediary points; and  
      define a third set of attributes, the third set of attributes defining a transition between the two intermediary points.

25       40. The computer program product of claim 39, further comprising instructions operable to cause a computer to:

      render the color gradient in accordance with the defined gradient starting point, the gradient ending point, the two intermediary points and the first, second and third set of attributes.

41. The computer program product of claim 30, wherein the color gradient is a linear color gradient and the set of gradient attributes includes an angle attribute, and wherein the instructions to define a first and a second set of values include instructions to:

define a value of the angle of the color gradient relative to a tangent of a bounding box edge for the region to which the color gradient is to be applied.

42. The computer program product of claim 30, wherein the color gradient is a radial color gradient and the set of gradient attributes includes an offset attribute, and wherein the instructions to define a first and a second set of values include instructions to:

define a value of the offset of the color gradient relative to a center of a bounding box for the region to which the gradient is to be applied.

43. The computer program product of claim 42, wherein the instructions to define a value of the offset include instructions to:

define a value of an offset in a horizontal direction relative to the center of the bounding box.

44. The computer program product of claim 42, wherein the instructions to define a value of the offset include instructions to:

define a value of an offset in a vertical direction relative to the center of the bounding box.

45. The computer program product of claim 30, wherein the set of attributes includes a color attribute, and wherein the instructions to define a first and a second set of values include instructions to:

define a color for one or more of the at least one intermediary point, the starting point and the ending point.

46. The computer program product of claim 45, wherein the set of attributes includes a rate of change attribute, and wherein the instructions to define a first and a second set of values include instructions to:

define a value of a rate of change of a color in the color gradient between a color associated with one of the starting point, the ending point, and the at least one intermediary point and a color associated with an adjacent point.

- 5      47. The computer program product of claim 46, wherein a color is represented by a set of color components and the instructions to define a value of a rate of change include instructions to:

10      define a value of a rate of change for one or more color components in the color gradient between a color component set associated with one of the starting point, the ending point, and the at least one intermediary point and a color component set associated with an adjacent point.

- 15      48. The computer program product of claim 45, wherein the set of attributes includes a constant color attribute, and wherein the instructions to define a first set and a second set of values include instructions to:

define a value of the constant color attribute defining a portion of the color gradient for which a color component remains constant.

- 20      49. The computer program product of claim 45, wherein the set of attributes includes a color traversal attribute, and wherein the instructions to define a first and a second set of values include instructions to:

define a set of colors to be traversed between two defined points in the color gradient.

- 25      50. The computer program product of claim 49, wherein the instructions to define a set of colors include instructions to:

define a set of colors including selecting colors in a color wheel.

- 30      51. The computer program product of claim 30, wherein the set of attributes includes a color function attribute and wherein the instructions to define a first and a second set of values include instructions to:



define a mathematical function describing a color variation between two points in the color gradient.

52. The computer program product of claim 51, wherein the instructions to define a mathematical function include instructions to:  
define a non-linear mathematical function.

53. The computer program product of claim 51, wherein the instructions to define a mathematical function include instructions to:

define a mathematical function describing the variation of one or more color components between the two points in the color gradient.

54. The computer program product of claim 51, wherein the instructions to define a mathematical function includes instructions to:

receive a user input specifying the mathematical function.

55. The computer program product of claim 30, wherein the set of attributes includes a color conversion function attribute, and wherein the instructions to define a first and a second set of attributes include instructions to:

define a mathematical function describing a color contour between two points in the color gradient.

56. The computer program product of claim 55, wherein the instructions to define a mathematical function include instructions to:

define a non-linear mathematical function.

57. The computer program product of claim 55, wherein the instructions to define a mathematical function include instructions to:

receive a user input specifying the mathematical function.

58. The computer program product of claim 30, further comprising instructions operable to cause a computer to:

define a mathematical function describing a variation of a gradient attribute between two points in the color gradient, the gradient attribute being selected from the group consisting of an angle, an offset in a horizontal direction, an offset in a vertical direction, a rate of change for a color, and a portion of the color gradient having constant color.

59. A computer-implemented method for rendering a color gradient to be applied to a region, the method comprising:

defining a gradient starting point, the gradient starting point being associated with a starting color;

defining a gradient ending point, the gradient ending point being associated with an ending color;

defining at least one intermediary point between the gradient starting point and the gradient ending point, the at least one intermediary point being associated with an intermediate color;

defining a set of gradient attributes;

associating a set of gradient attribute values with the at least one intermediary point and one of the gradient starting point and the gradient ending point, each set of values defining a color transition between the associated point and an adjacent point; and

rendering the color gradient in accordance with the gradient starting color, the gradient ending color, the at least one intermediate color and the respective sets of values associated with the gradient starting point, the gradient ending point and the least one intermediary point.